

**REDISCOVERY OF *POLYSTOECHOTES GAZULLAI* NAVÁS
(NEUROPTERA: POLYSTOECHOTIDAE)**

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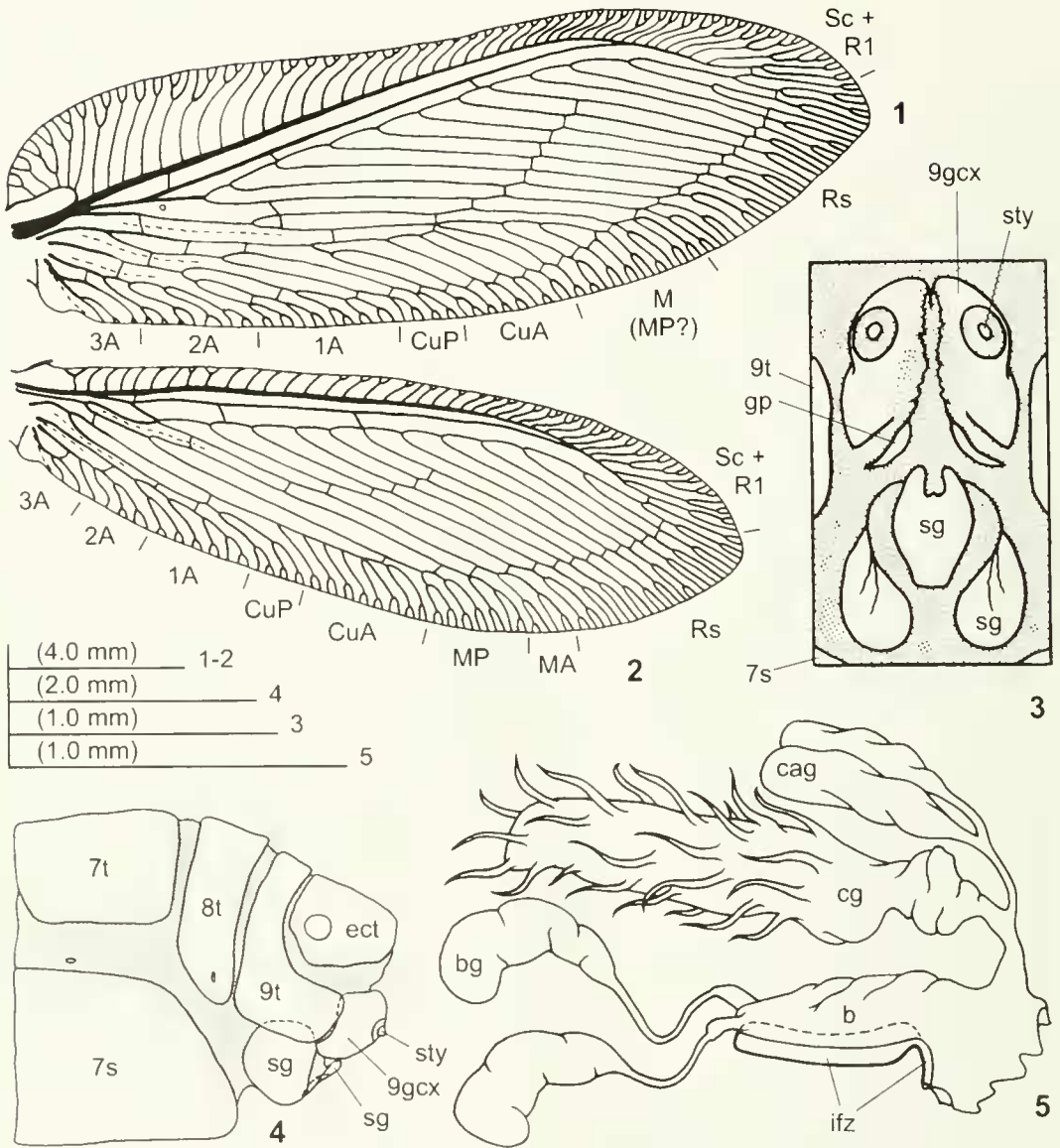
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Abstract.—*Polystoechotes gazullai* is redescribed and figured from a single female specimen collected near Vallenar, Chile, in 1989. This is the first new record of *P. gazullai* to be published since its original description in 1924. The whereabouts of the holotype of *P. gazullai* is unknown; consequently, the new specimen described here is also the only known extant specimen of this species. *Polystoechotes gazullai* appears to be correctly placed in the family Polystoechotidae, but its relationships with other polystoechotid species remain uncertain.

Key Words: Insecta, Polystoechotidae, giant lacewings, Chile

The small New World neuropteran family Polystoechotidae contains only four known extant species as follows (distributions in parentheses): *Fontecilla graphicus* Navás (Chile), *Platystoechotes lineatus* Carpenter (USA: California), *Polystoechotes punctatus* Fabricius (North America from southern Canada south to Panama), and *Polystoechotes gazullai* Navás (Chile). Polystoechotids are generally regarded as relatively "primitive" neuropterans related, somewhat tentatively, to itonids and rapsimatids. Although none of the species of the family Polystoechotidae are particularly well known, sufficient specimens of the first three species listed above have accumulated in collections to permit their adequate characterization. *Polystoechotes gazullai*, on the other hand, has remained enigmatic for many years. Originally described in 1924 by Longinos Navás from apparently a single specimen collected by the Jesuit father, Reverend Padre Gazulla, at Las Mercedes, Chile, no additional specimens of *P. gazullai* have subsequently been reported in the

literature. The primary type of *P. gazullai*, formerly contained in Navás' personal collection, has apparently been lost or destroyed. Furthermore, Navás' original description of *gazullai* was unillustrated, rather brief and largely restricted to superficial venational and coloration characters. Consequently, the validity and identity of *P. gazullai* have long been questioned. A single new specimen attributable to *P. gazullai* was collected near Vallenar in north-central Chile by Robert Miller and Lionel Stange in 1989. This specimen, a female, provides the first opportunity to shed additional light on this species since its original description. The redescription provided below, based on this new specimen, provides the first available information on the terminalia of *P. gazullai* and the first illustrations of its wing venation. It is hoped that this redescription will bring *P. gazullai* to the attention of Chilean collectors and generate additional material, especially males, for additional study.



Figs. 1-5. *Polystoechotes gazullai*, female. 1, Forewing, dorsal (left forewing converted to right dorsal view). 2, Hind wing, dorsal (left hind wing converted to right dorsal view). 3, Abdominal apex detail, posteroventral. 4, Abdominal apex, lateral. 5, Internal genitalia, dorsolateral. Abbreviations: 1A, 2A, 3A, anal veins; 7s, seventh sternite; 7t, 8t, 9t, tergites; 9gcx, ninth gonocoxite; b, bursa; bg, bursal gland; cag, colleterial accessory gland; cg, colleterial gland; CuA, cubitus anterior; CuP, cubitus posterior; ect, ectoproct; gp, gonapophysis posterioris; ifz, insemination/fertilization canal; M, media; MP, media posterior; R1, first branch of radius; Rs, radial sector; Sc, subcosta; sg, subgenitale; sty, stylus.

Polystoechotes gazullai Navás
(Figs. 1-6)

268 (mentioned); Penny [1978]:49 (listed).

Polystoechotes gazullai Navás, 1924:14
(original description); Carpenter 1940:

Diagnosis.—Readily distinguishable from *Fontecilla graphicus*, the only other

polystoechotid known from the Americas south of Panama, by the following characters (corresponding characters in *F. graphicus* are given in parentheses): apex of forewing not falcate (falcate); mesothorax with a fuscous median stripe (mesothorax flavous medially); hind wing without prominent maculae (prominent maculations present, especially near margins); forewing with one nygma (two nygmata usually present, the distal nygma sometimes absent); hind wing lacking nygmata (one nygma usually present, sometimes absent).

Description.—*Head*: Partially retracted under pronotum; antenna filiform, ca. half as long as forewing; eyes hemispherical, small; ocelli absent; vertex covered with longer brown and shorter white recumbent macrotrichia.

Thorax: Pronotum short and broad; pro- and mesonotum covered with erect to suberect brownish macrotrichia and shorter recumbent white macrotrichia; mesonotum fuscous (medially and laterally) with a pair of parasagittal flavous stripes extending from prescutum to scutellum; legs densely setose; tibial spurs present, straight; tarsi 5-segmented; unguis simple, arched.

Forewing (Figs. 1, 6): *Length*: 19.5 mm; a single nygma present in radio-medial space slightly distal to fork R1-Rs, other nygmata lacking; jugal lobe prominent. *Venation*: trichosores (not shown in Figs. 1–2) prominent and distinct distally, fused into a marginal vein proximally; marginal end-twigging of longitudinal veins prominent; humeral vein pectinately branched, anterior humeral trace recurrent, enclosing an elongate humeral space; nearly all subcostal veinlets branched; pterostigmal region indistinct; subcosta distally touching R1, but not insensibly fused; subcosto-radial space with a single crossvein, located basally; radial space with two nearly complete gradate series, outer series continuing basally into medial, cubital and anal areas; anterior sectoral trace pectinate, with 12 branches proximal to the outer gradate series; R-Rs space with three crossveins. *Col-*

oration: Veins mostly fuscous, with irregular flavous segments; membrane hyaline with fuscous maculations, maculations especially prominent in pterostigmal region, adjacent to anterior radial and anterior cubital traces and along outer gradate series in medial and radial spaces; some maculae in basal portions of costo-subcostal, subcosto-radial and intraradial spaces vaguely aligned to form a pair of tenuous oblique bands. *Vestiture* (dorsal surface): veins bearing long erect to suberect fuscous setae and shorter, more recumbent, white setae; membrane with microtrichia absent except for extreme base of wing (e.g. humeral space, jugal space)

Hind wing (Figs. 2, 6): *Length*: 17.0 mm; nygmata entirely lacking; jugal lobe distinct. *Venation*: similar to forewing but costo-subcostal space narrower, humeral vein only slightly recurrent, not pectinately branched, most other proximal subcostal veinlets simple, distal veinlets of same space mostly forked; basal crossvein of subcosto-radial space weakly developed but present; anterior sectoral trace 10–12 branched; sigmoid vein (base of MA) present. *Coloration*: Veins hyaline to fuscous, but largely lacking prominent alternating segments of contrasting color; membrane largely hyaline, but with some brownish clouding, especially in pterostigmal region. *Vestiture* (dorsal surface): fuscous vein setae more recumbent, white vein setae largely lacking; microtrichia as in forewing.

Female terminalia: *Tergite 7* (Fig. 4, 7t): Hemiannular, unmodified; *Sternite 7* (Fig. 4, 7s): Hemiannular, somewhat elongated ventrally, posterior margin shallowly emarginate medially. *Tergite 8* (Fig. 4, 8t): Hemiannular, dorsally about one-half as long as tergite 7, ventrolateral margins prolonged and enclosing spiracles of 8th somite, prolonged lobes narrowed and rounded. *Tergite 9* (Fig. 4, 9t): A narrow strap dorsally, expanded and subtending ectoprocts ventrally, not divided on dorsal midline. *Ectoprocts* (Fig. 4, ect): A single, broad, transverse plate, not divided or weakened on

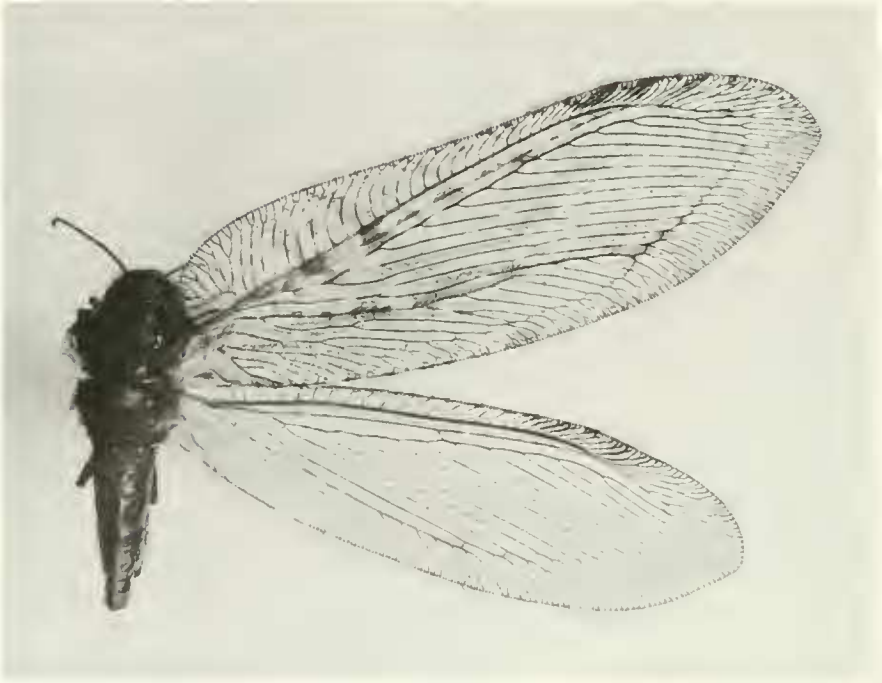


Fig. 6. *Polystoechotes gazullai*, female, body and wings.

dorsal midline; cercal calli present, each with ca. 35 trichobothria, trichobothrial alveoli rosetiform. *9th gonocoxites* (Figs. 3–4, 9gex): Present, reniform; stylus (sty) present as a short setose papilla. *Gonapophyses posteriores* (Fig. 3, gp): Present, a pair of crescentic, sclerotized, concave plates; *Subgenitale* (Figs. 3–4, sg): Present, large, tripartite, consisting of a small ovate median sclerite and a pair of larger lateral sclerites, lateral and median sclerites separated from each other by narrow membranous regions; median sclerite prominently emarginate distally and bearing a field of short setae on proximal half (not illustrated); lateral sclerites somewhat D-shaped in lateral view, aetose. *Bursa copulatrix* (Fig. 5, b): Walls membranous, colleterial gland (cg) and colleterial accessory glands (cag) present, attached to proximodorsal roof of bursa at a short common duct, colleterial gland bearing numerous slender processes, one pair of bursal glands (bg) present, each consisting of an inflated lobe joined by a slender duct to the bursa near the anterior

end of the insemination/fertilization canal. *Insemination/fertilization canal* (Fig. 5, ifz): “Spermatheca” of the slit-entry type, thick-walled and darkly tanned, ventral surface shallowly concave; width gradually expanded posteriorly until abruptly narrowed at beginning of distal portion of fertilization canal, which is short and simply arched, not arranged as a series of arched loops.

Natural history and immature stages.—Unknown. The specimen redescribed here was collected at light in a desert region (L. Stange, personal communication).

Distribution.—Known only from Chile.

Primary type.—Holotype, sex unknown, not examined (holotype presumed, number of specimens examined by Navás unstated, description probably based on a single specimen). Formerly contained in the personal collection of L. Navás, now presumed lost or destroyed. Not listed in Monserrat (1985). Type data from original description [bracketed material added]: “Chile: Las Mercedes, R[everend]. P[adre]. Gazulla, Enero [=January] de 1924 (Col[ección].

m[ihi].)'' There are at least three localities and populated places in Chile named ''Las Mercedes.'' These three range between 32°51'S and 34°44'S and are all in the vicinity of Santiago.

Material examined.—Chile: Antofagasta Prov.: 1♀, 16 km S. Vallenar, 10.ii.1989, 1000 m, R. Miller & L. Stange (Florida State Collection of Arthropods).

Etymology.—Unexplained, probably from the surname of Reverend Padre Gazulla, collector of the holotype.

Discussion.—The phylogenetic position of *P. gazullai* with respect to other polystoechotids is not entirely clear, and only a few general notes in this regard can be provided at the present time. A more detailed analysis will have to wait until a broader review of the family is available. Additionally, knowledge of the phylogenetic position of *P. gazullai* is negatively impacted by the fact that the male of this species is unknown.

Navás apparently placed *gazullai* in the genus *Polystoechotes* on the basis of the generally similar body form and on venational similarities. No combined generic diagnosis encompassing both species of *Polystoechotes* (*gazullai* and *punctatus*) has ever been published, and there is no evidence that any neuropterist other than Navás ever examined the holotype of *P. gazullai*. Comparisons between *P. punctatus* and *P. gazullai* made for this work suggest that the two species are not particularly closely related, although they share many apparently plesiomorphic traits.

The wing venation of both *Polystoechotes* species is similar, but this similarity is due largely to the possession of traits that are probably plesiomorphic at the level of this family (e.g. in the forewing: trichosores present distally; end-twigging of longitudinal veins well developed; Rs originating near wing base; Rs with numerous pectinate branches; cubital and anal areas well developed; nygmata present; and, in the hind wing: a sigmoid vein present). The shape of the forewing and the humeral space differ

significantly between the two species. In *P. gazullai* (Fig. 1), the forewing humeral region is broad and the margins of the wing are nearly parallel sided basally. In *P. punctatus* (see Carpenter 1940:268, fig. 69), the forewing humeral region is narrow (only slightly wider than the width of the costo-subcostal space distally), and the hind margin of the wing is prominently rounded. One notable (derived?) similarity between the two species is the nearly total restriction of the end-twigging of forewing Rs branches to the immediate vicinity of, or beyond, the outer gradate series.

The female terminalia of both *Polystoechotes* species are also of generally similar form. But, this similarity is also probably based on plesiomorphic traits (e.g. eighth tergite ends enclosing spiracles of eighth somite; ninth tergite ends enlarged posterovertrally and subtending ectoprocts; ectoprocts in the form of a single, undivided, transverse plate; paired ninth gonocoxites present, and each bearing a distinct stylus; sclerotized portion of insemination/fertilization canal narrow and with only a short distal duct; colleterial, colleterial accessory and bursal glands all present). The subgenitale is strongly developed in both *P. gazullai* and *P. punctatus* (as in other polystoechotids), but is of substantially different form in the two species. In *P. gazullai*, the subgenitale is distinctly tripartite, consisting of a distally emarginate, suboval, median plate, which is flanked by a pair of large D-shaped (lateral view) lateral plates. All three plates are closely membranously associated ventrally (Fig. 3), and the morphology and arrangement of these sclerites is similar to the condition found in the other Chilean polystoechotid species, *Fontecilla graphicus*. In *P. punctatus*, the subgenitale is a single broad median sclerite that possesses a strongly-sclerotized, ascending, lateral lobe on each side. From the anterodorsal angles of these lobes arises a slender sclerotized bridge that arches across the dorsal surface of the bursa over the insemination/fertilization canal. This bridge is

unique within the family Polystoechotidae, and nothing similar is present in *P. gazullai*. The modifications of the subgenitale found in polystoechotids appear to be associated with a specialized method of male/female coupling in this group.

The lack of convincing synapomorphic traits linking *P. gazullai* and *P. punctatus* is reason to question the sister-group relationship implied between these species by their congeneric taxonomic status. However, until a more general analysis of relationships within the Polystoechotidae (and between polystoechotids and the apparently related "primitive" taxa in the families Ithonidae and Rapismatidae) can be undertaken, I believe that it is premature to make any substantive change to the taxonomy of *P. gazullai*. Consequently, *gazullai* is provisionally retained here in the genus *Polystoechotes*.

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